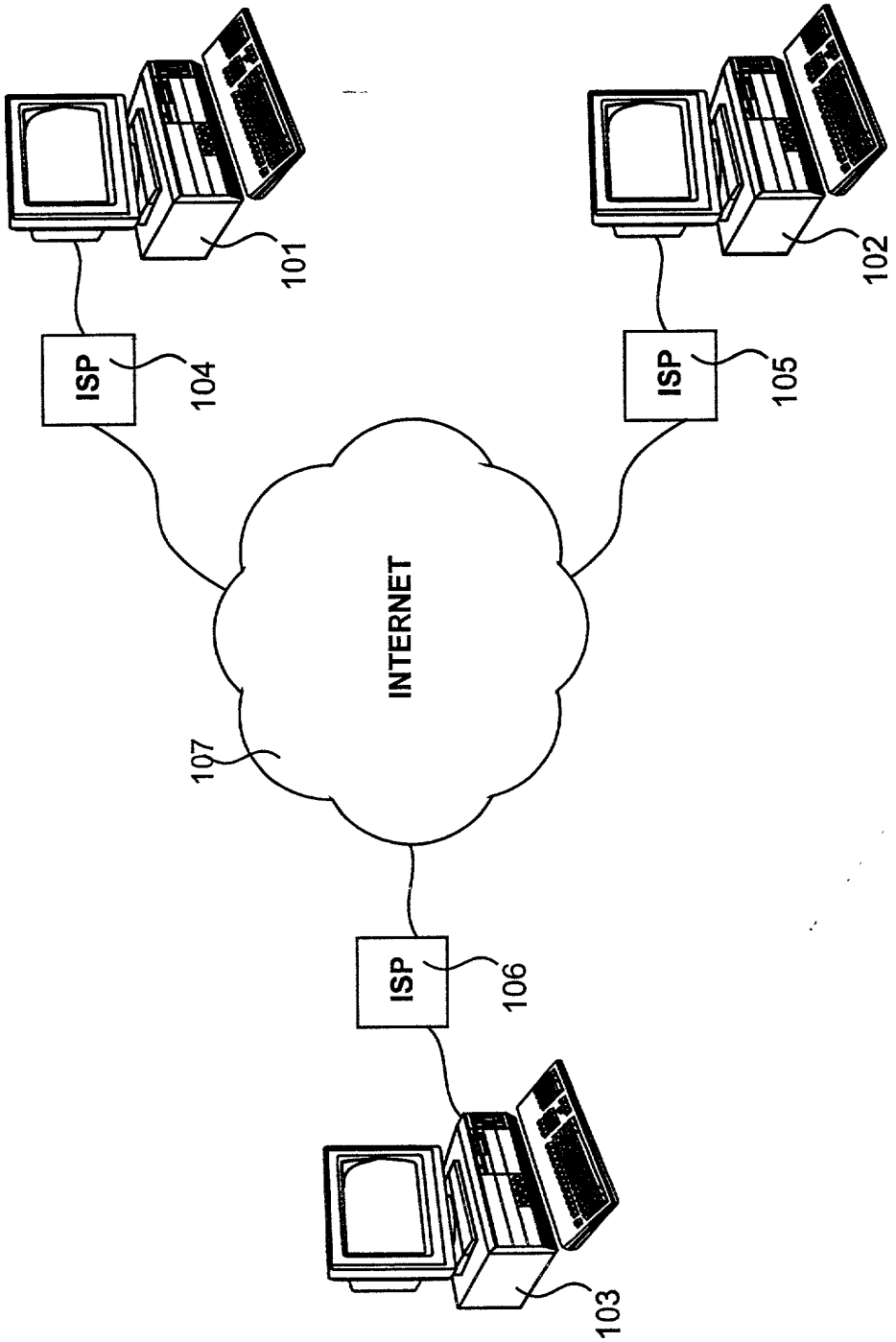

Figure 1

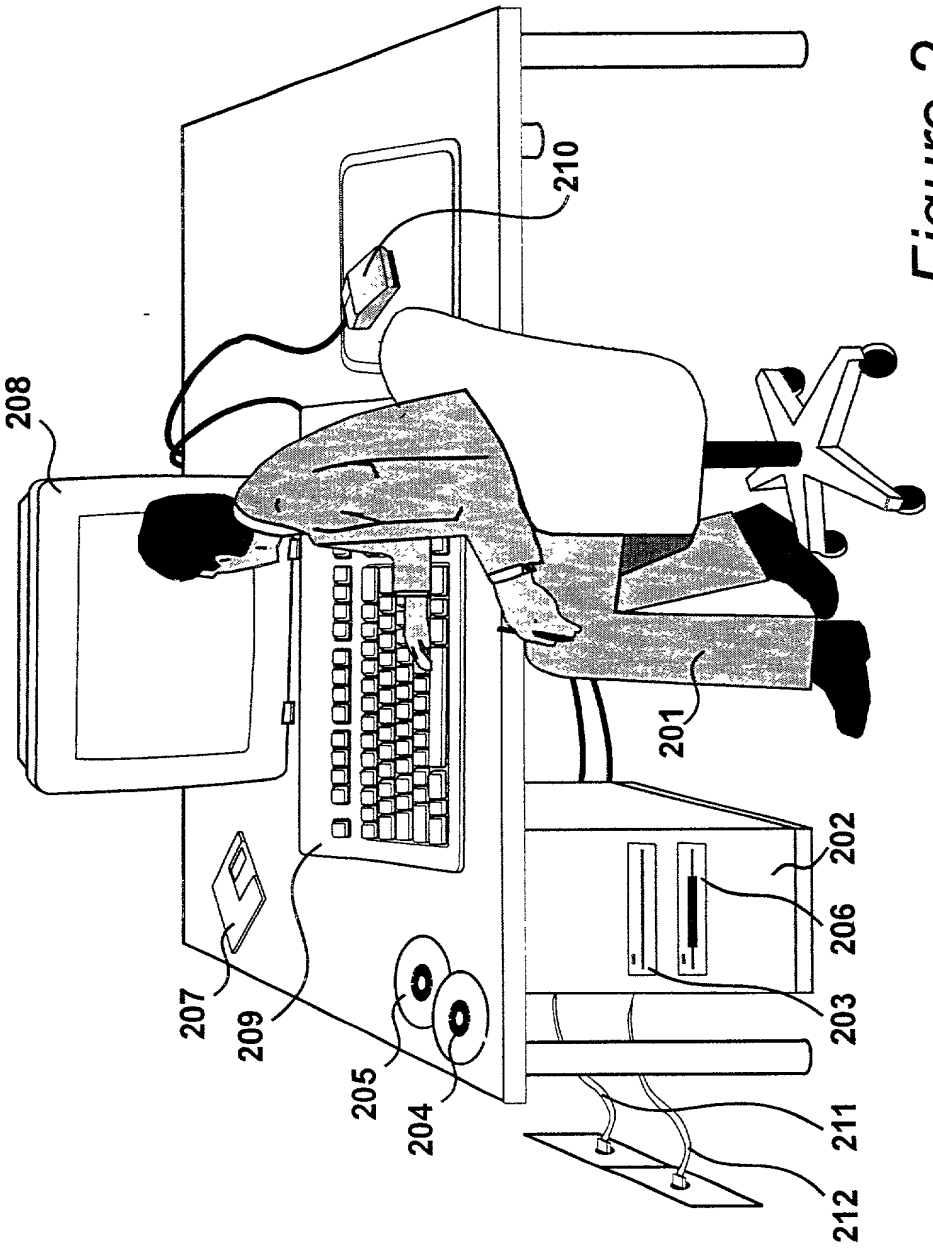

Figure 2

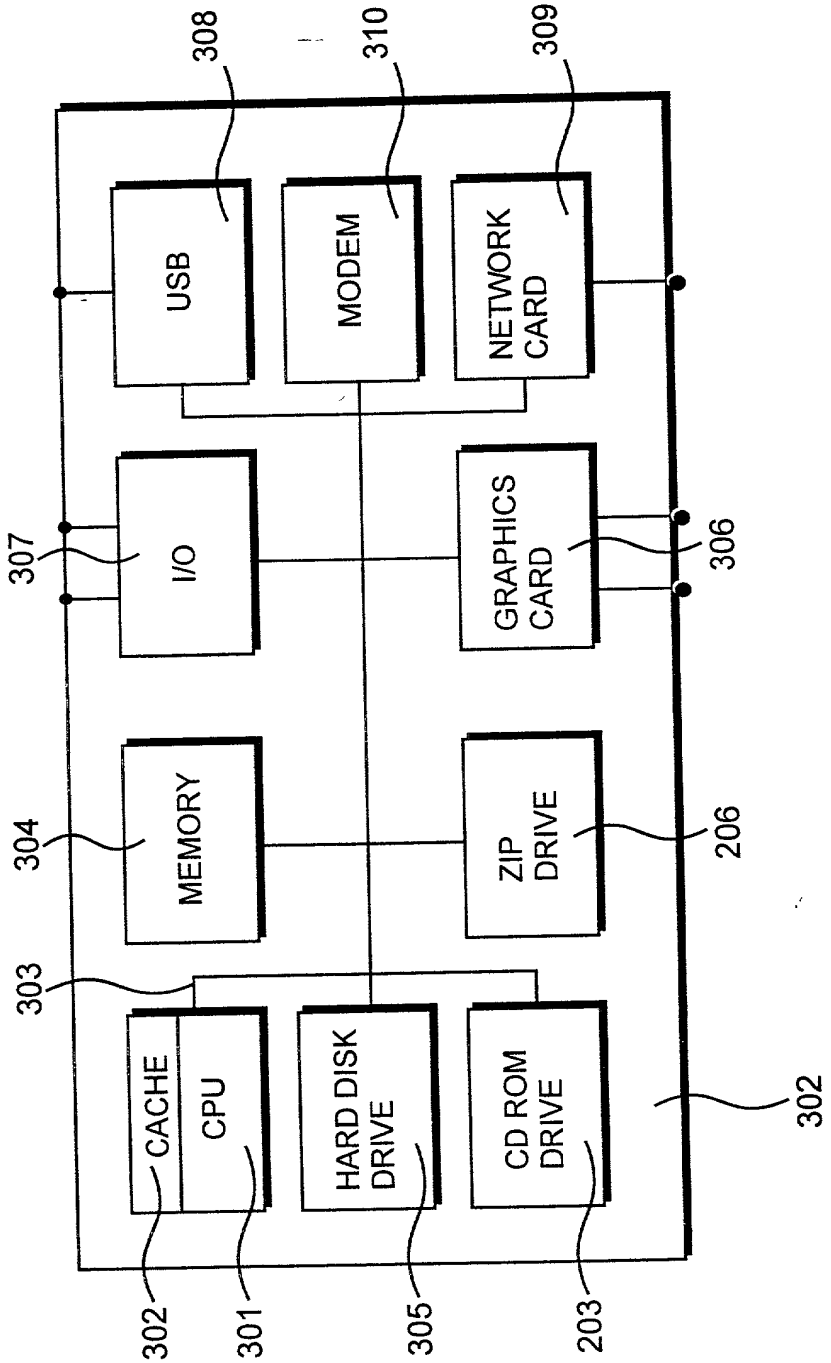
308
310
309
USB
MODEM
NETWORK CARD
307
I/O
GRAPHICS CARD
306
304
MEMORY
ZIP DRIVE
206
303
CACHE
CPU
HARD DISK DRIVE
CD ROM DRIVE
302
302
301
305
203

Figure 3

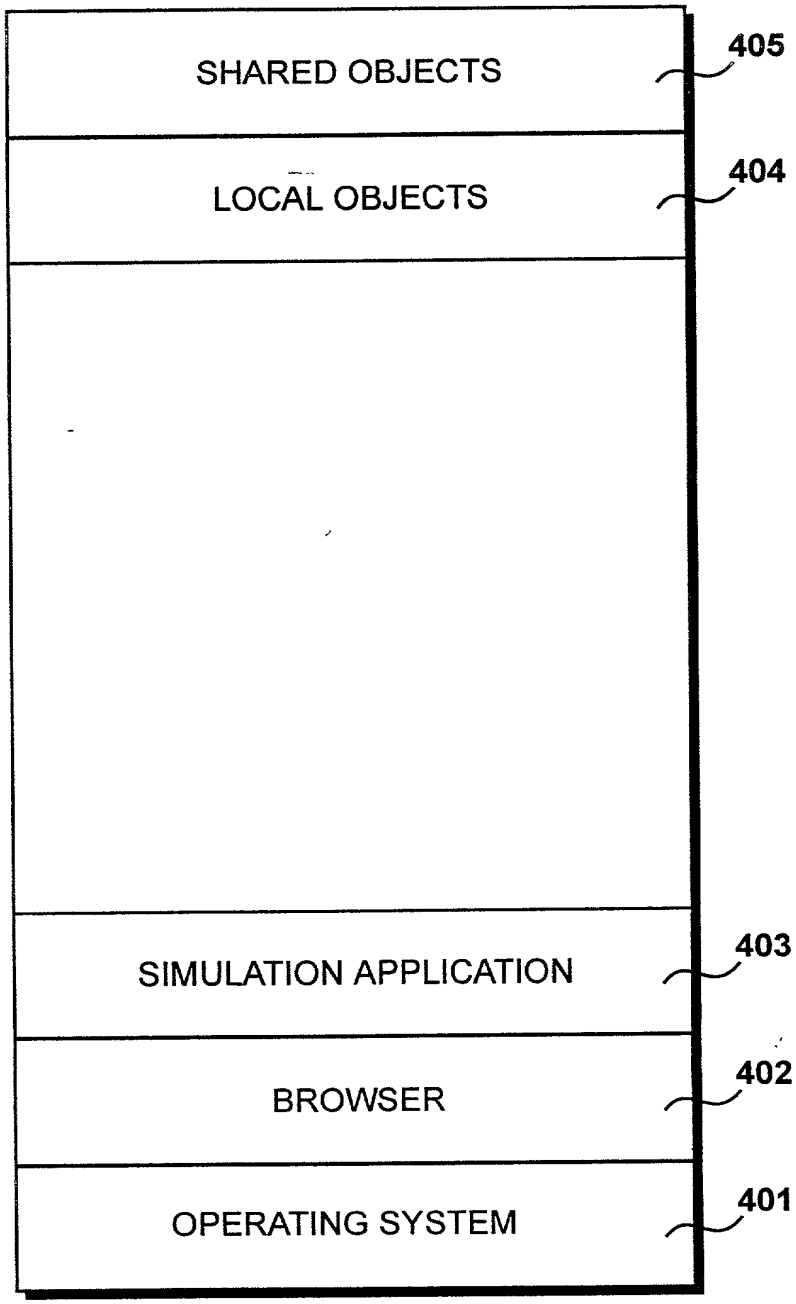
SHARED OBJECTS
405
LOCAL OBJECTS
404
SIMULATION APPLICATION
403
BROWSER
402
OPERATING SYSTEM
401

Figure 4

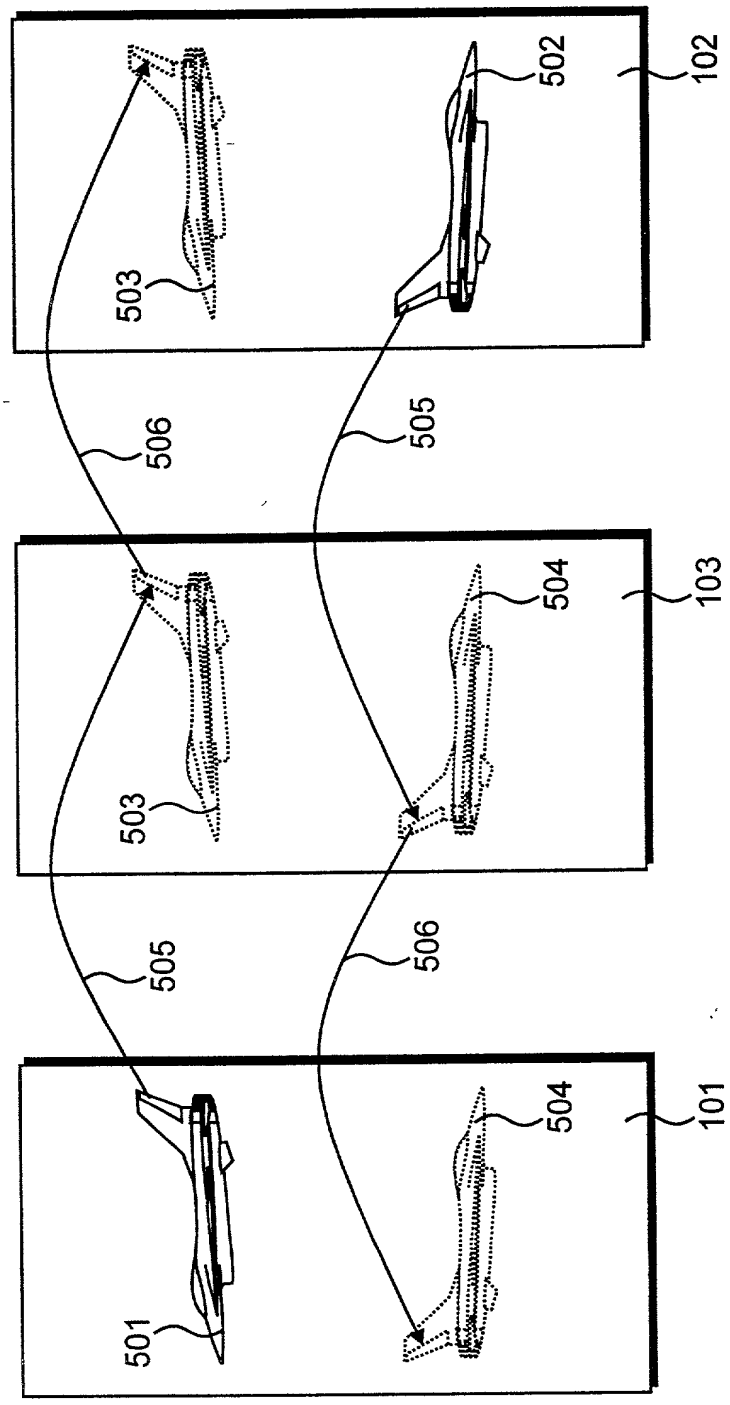

Figure 5

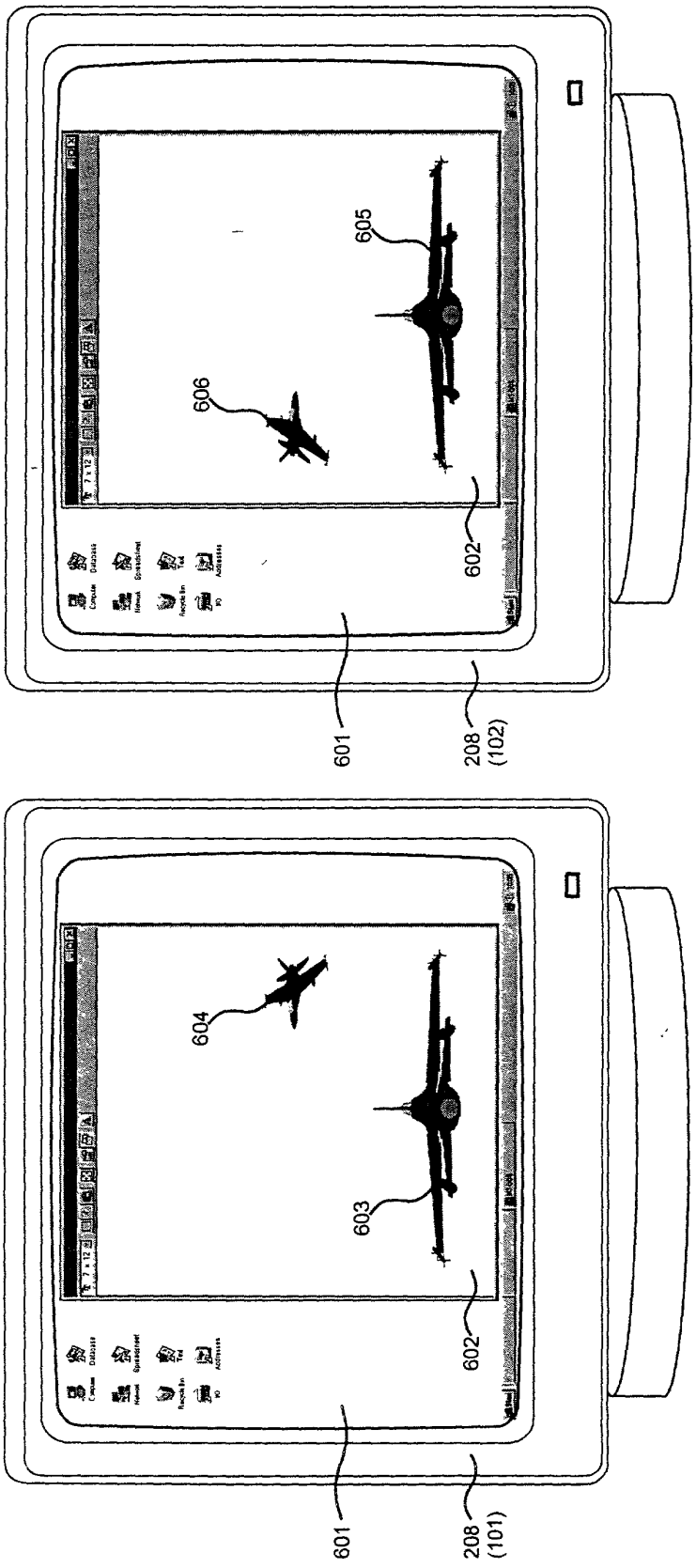

Figure 6

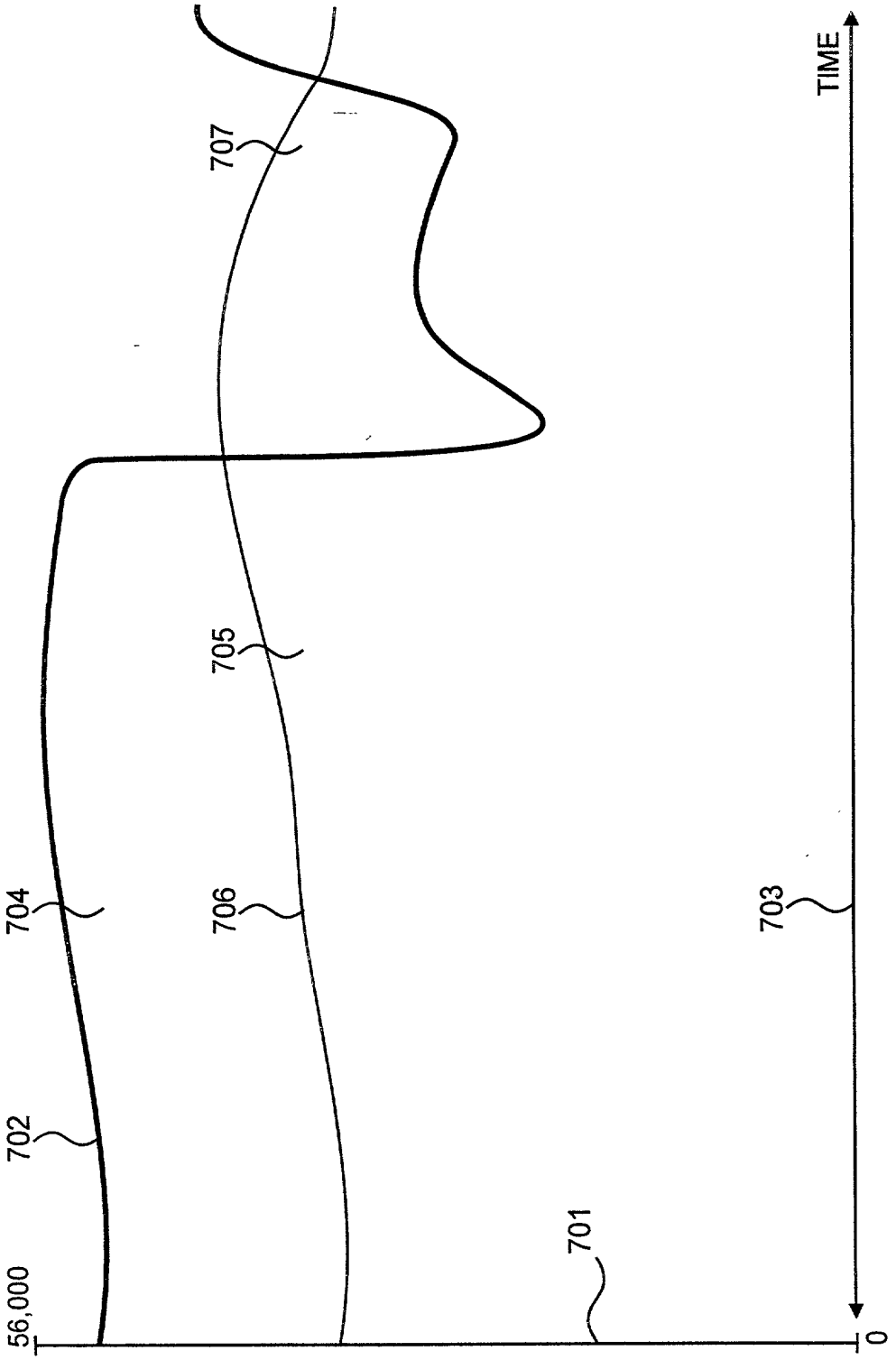

Figure 7

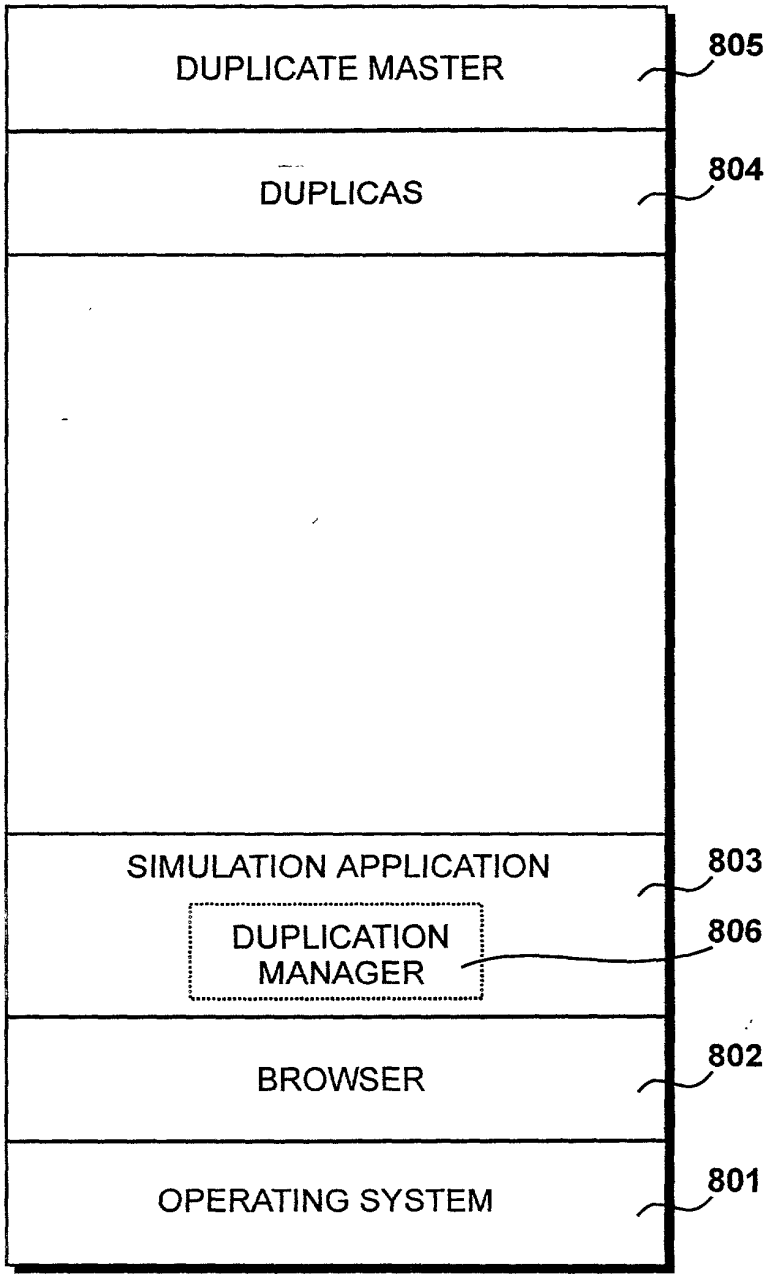
DUPLICATE MASTER
805
DUPLICAS
804
SIMULATION APPLICATION
803
DUPLICATION MANAGER
806
BROWSER
802
OPERATING SYSTEM
801

Figure 8

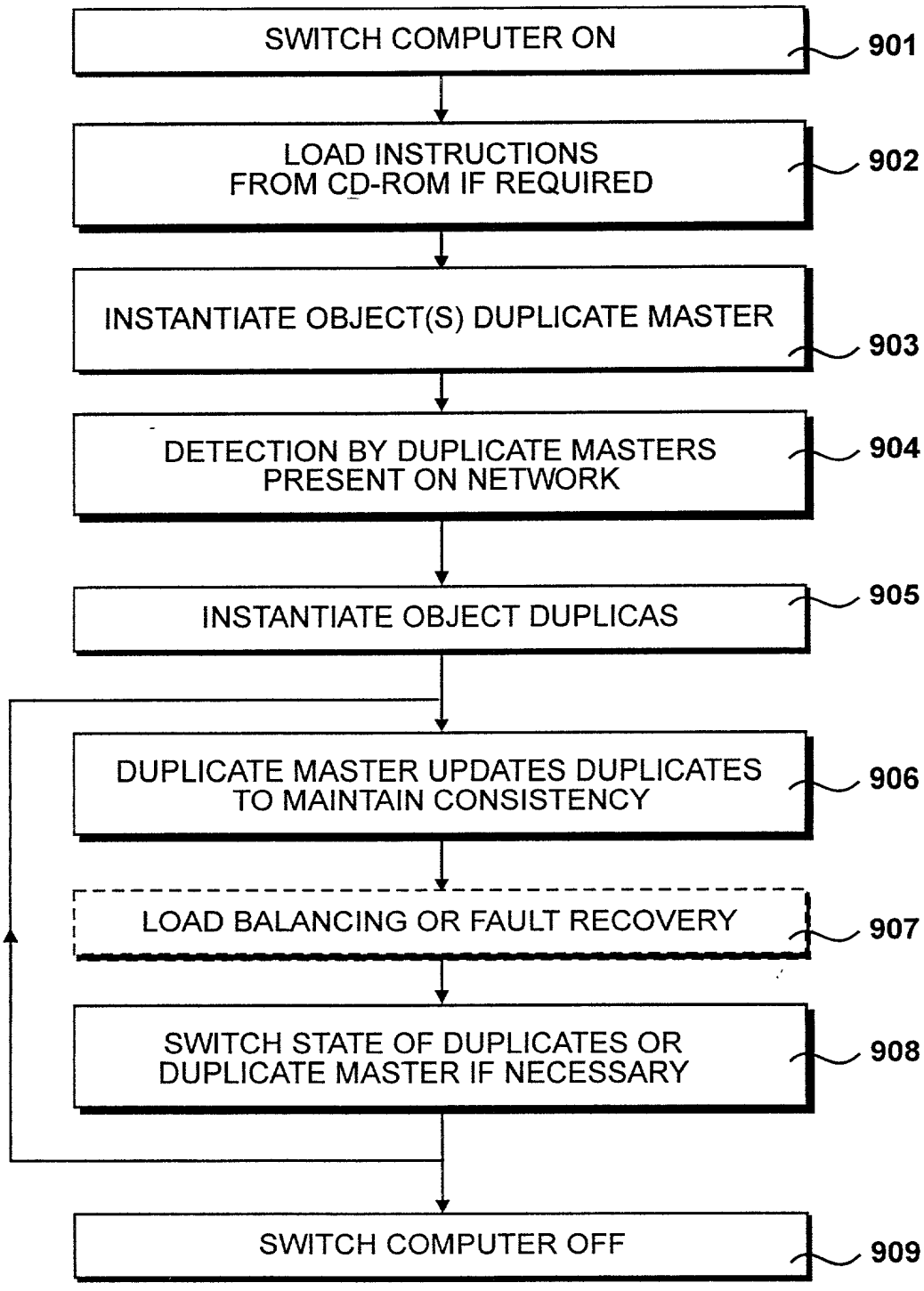
SWITCH COMPUTER ON
901
LOAD INSTRUCTIONS FROM CD-ROM IF REQUIRED
902
INSTANTIATE OBJECT(S) DUPLICATE MASTER
903
DETECTION BY DUPLICATE MASTERS PRESENT ON NETWORK
904
INSTANTIATE OBJECT DUPLICAS
905
DUPLICATE MASTER UPDATES DUPLICATES TO MAINTAIN CONSISTENCY
906
LOAD BALANCING OR FAULT RECOVERY
907
SWITCH STATE OF DUPLICATES OR DUPLICATE MASTER IF NECESSARY
908
SWITCH COMPUTER OFF
909

Figure 9

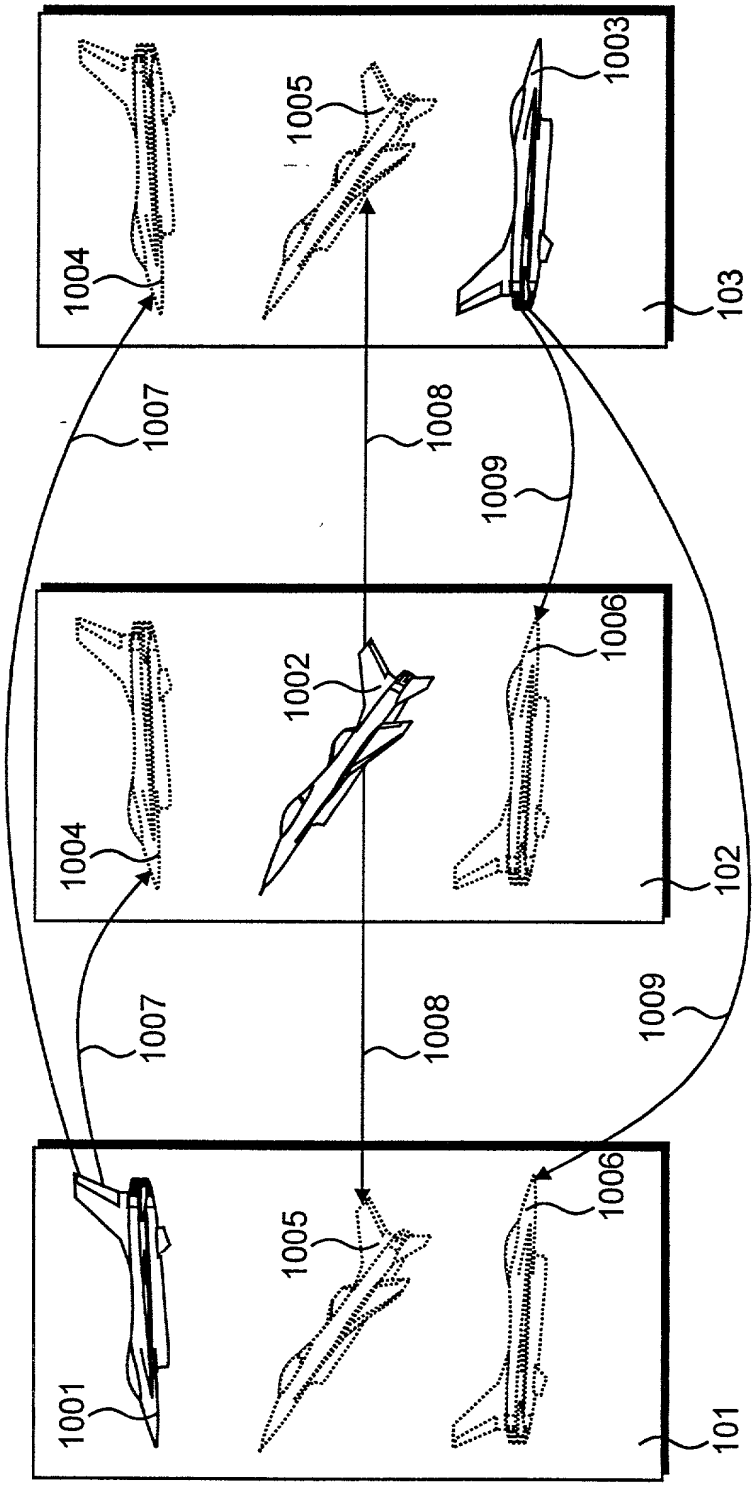

Figure 10

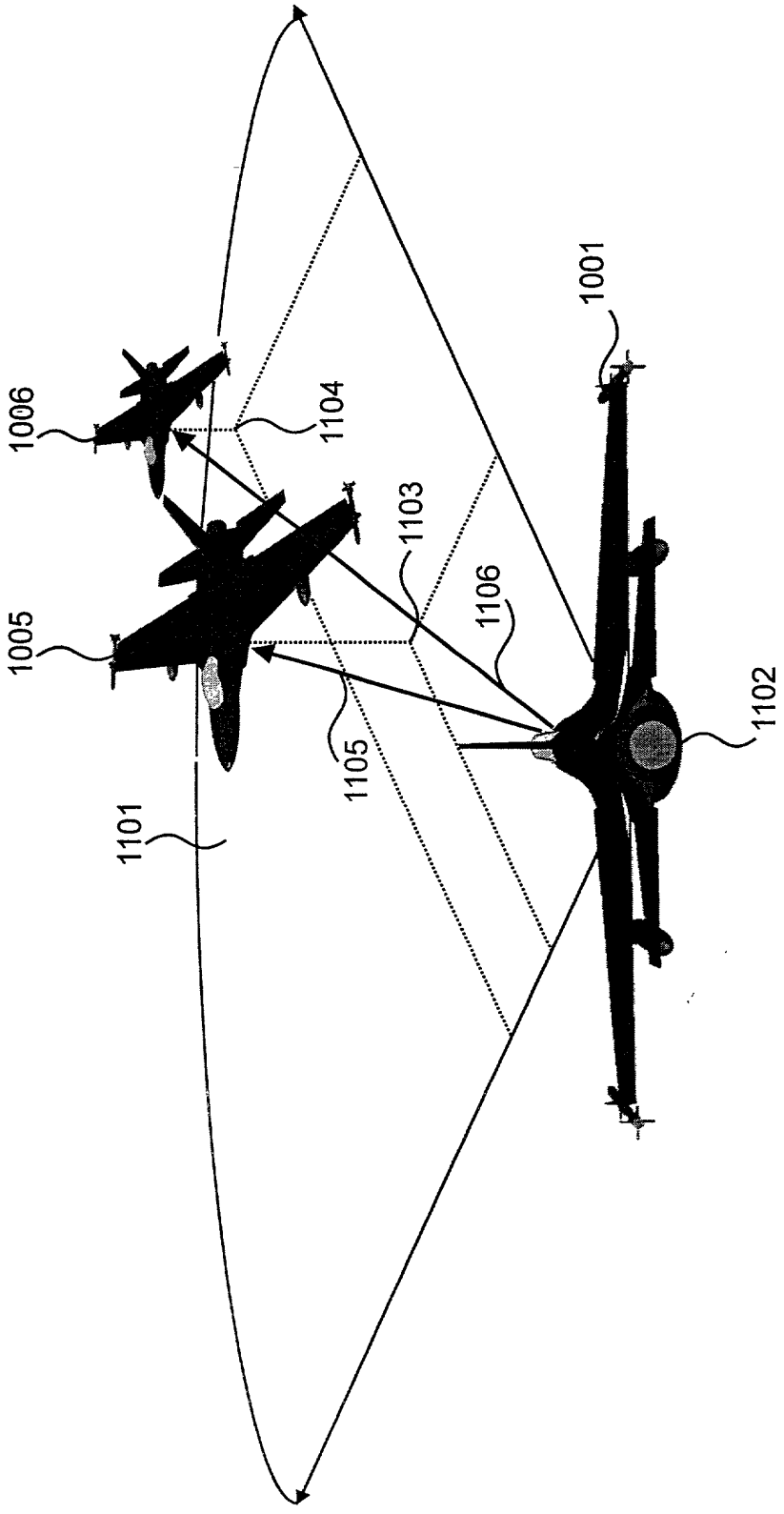

Figure 11

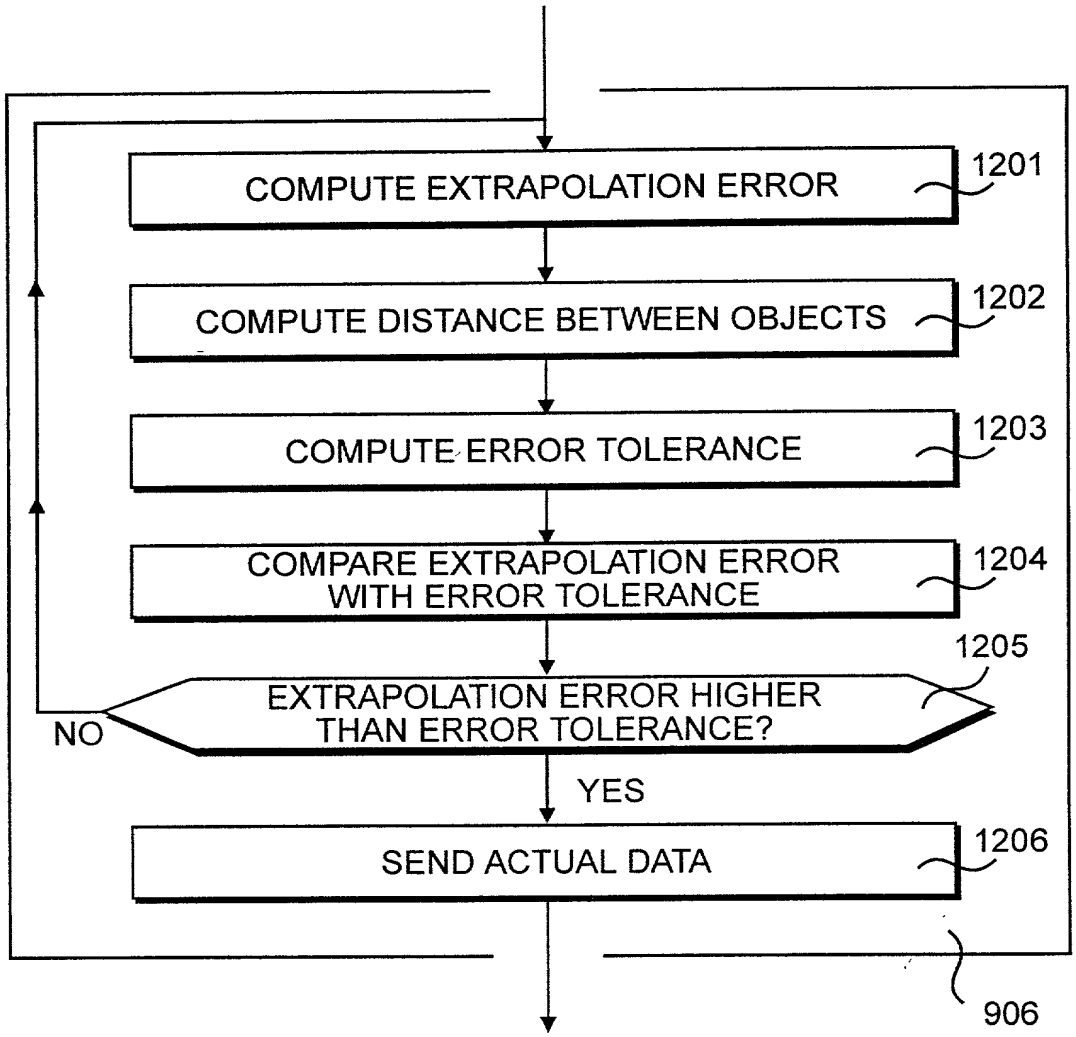
COMPUTE EXTRAPOLATION ERROR
1201
COMPUTE DISTANCE BETWEEN OBJECTS
1202
COMPUTE ERROR TOLERANCE
1203
COMPARE EXTRAPOLATION ERROR WITH ERROR TOLERANCE
1204
1205
EXTRAPOLATION ERROR HIGHER THAN ERROR TOLERANCE?
NO
YES
SEND ACTUAL DATA
1206
906

Figure 12

1301

$$E = \left[\sum_{i=1}^{n} \left(x_i - x'_i \right)^2 \right]^{\frac{1}{2}}$$

E = extrapolation error for x data
x = actual value of variable x at local terminal
x = extrapolated value of variable x at remote terminal

1302

$$Z = \left[\sum_{i=1}^{n} \left(x_{Duplica} - x'_{Observer} \right)^2 \right]^{\frac{1}{2}}$$

Z = distance between the observer and the duplica
x = actual value of variable x at local terminal
x' = extrapolated value of variable x at remote terminal

1303

$$T = dConstant + (dLinear \times Z) + (dQuadratic \times Z^2)$$

T = error tolerance
Z = distance between the observer and the duplica
dConstant = parameter for absolute minimum error tolerance
dLinear = coefficient for linear relationship between Z and T
dQuadratic = coefficient for quadratic relationship between Z and T

Figure 13

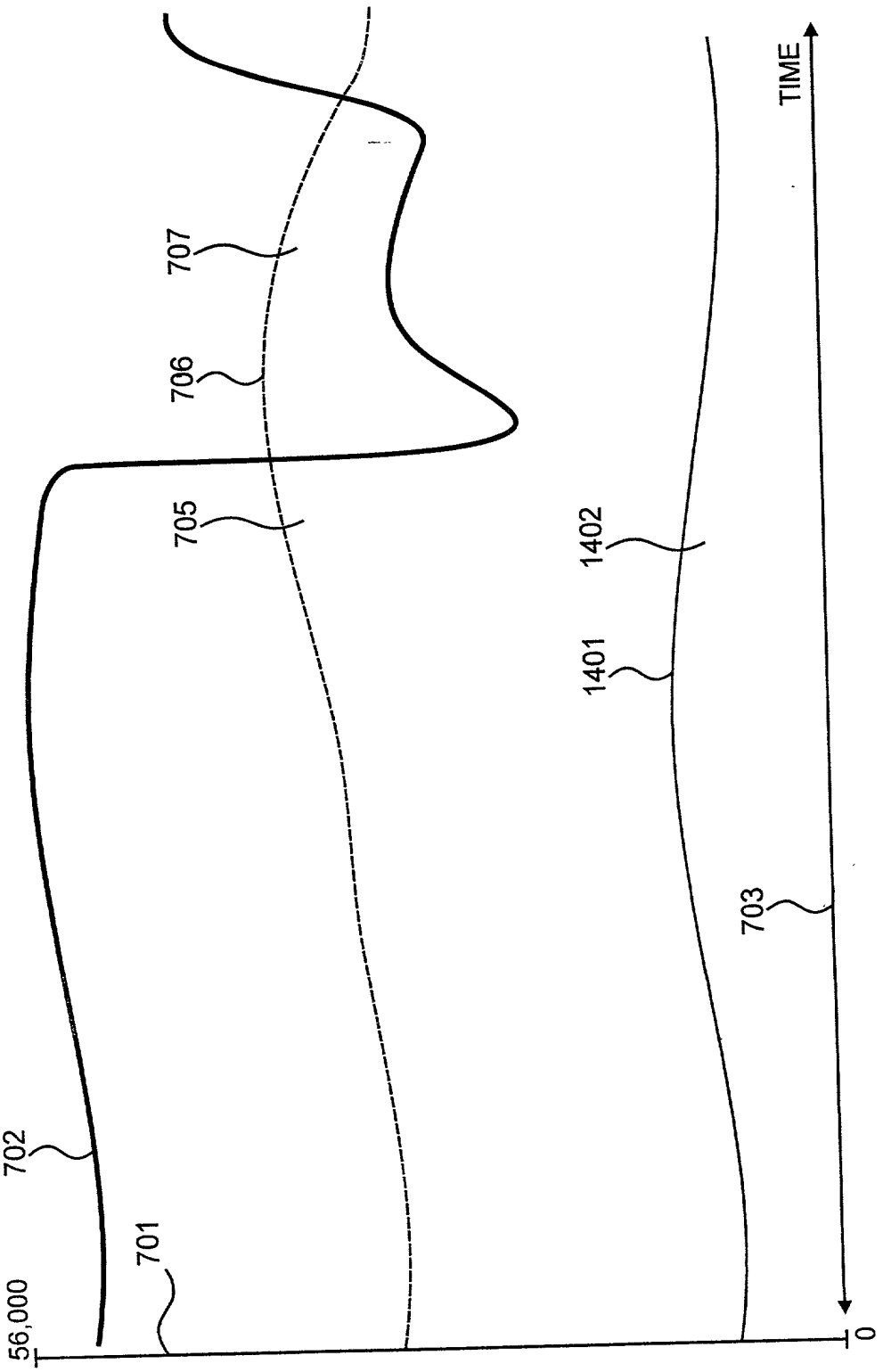

Figure 14

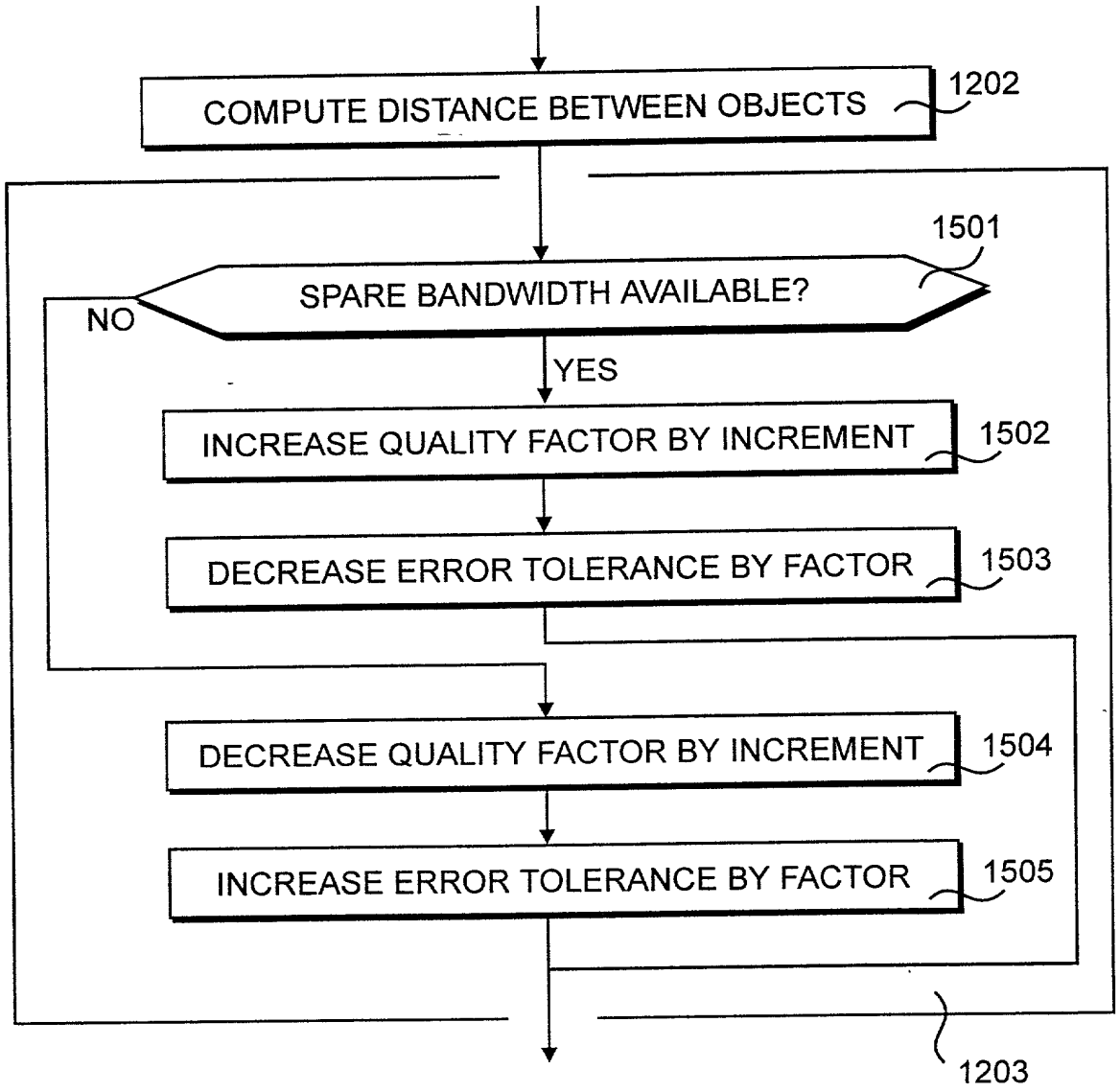
COMPUTE DISTANCE BETWEEN OBJECTS
1202
1501
SPARE BANDWIDTH AVAILABLE?
NO
YES
INCREASE QUALITY FACTOR BY INCREMENT
1502
DECREASE ERROR TOLERANCE BY FACTOR
1503
DECREASE QUALITY FACTOR BY INCREMENT
1504
INCREASE ERROR TOLERANCE BY FACTOR
1505
1203

Figure 15

1602

$$T = dConstant + [dLinear \times \left(\frac{Z}{Q}\right)] + [dQuadratic \times \left(\frac{Z}{Q}\right)^2]$$

T	= error tolerance
Z	= distance between the observer and the duplica
dConstant	= parameter for absolute minimum error tolerance
dLinear	= coefficient for linear relationship between Z and T
dQuadratic	= coefficient for quadratic relationship between Z and T
Q	= quality factor

1601

Figure 16

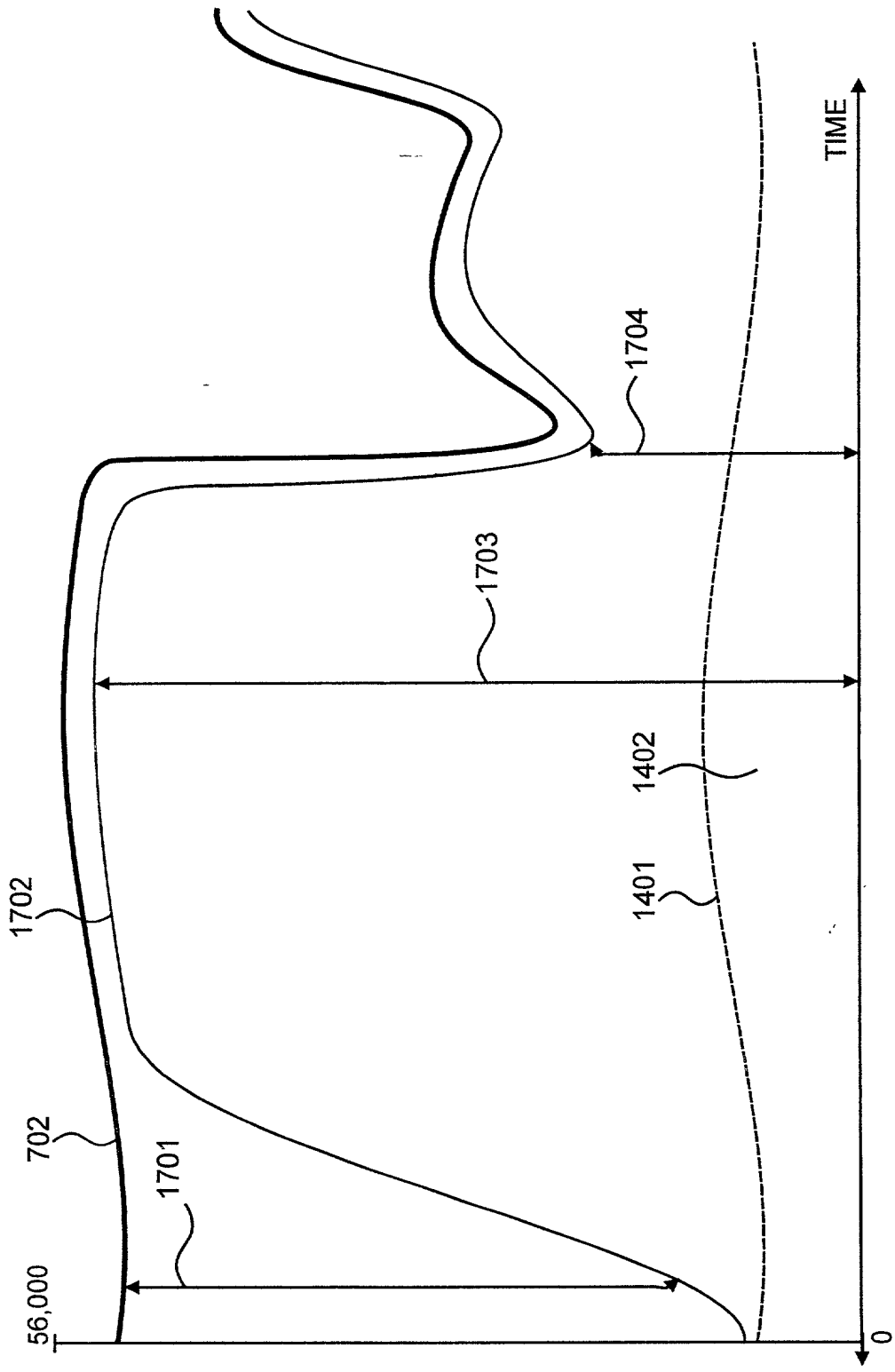

Figure 17

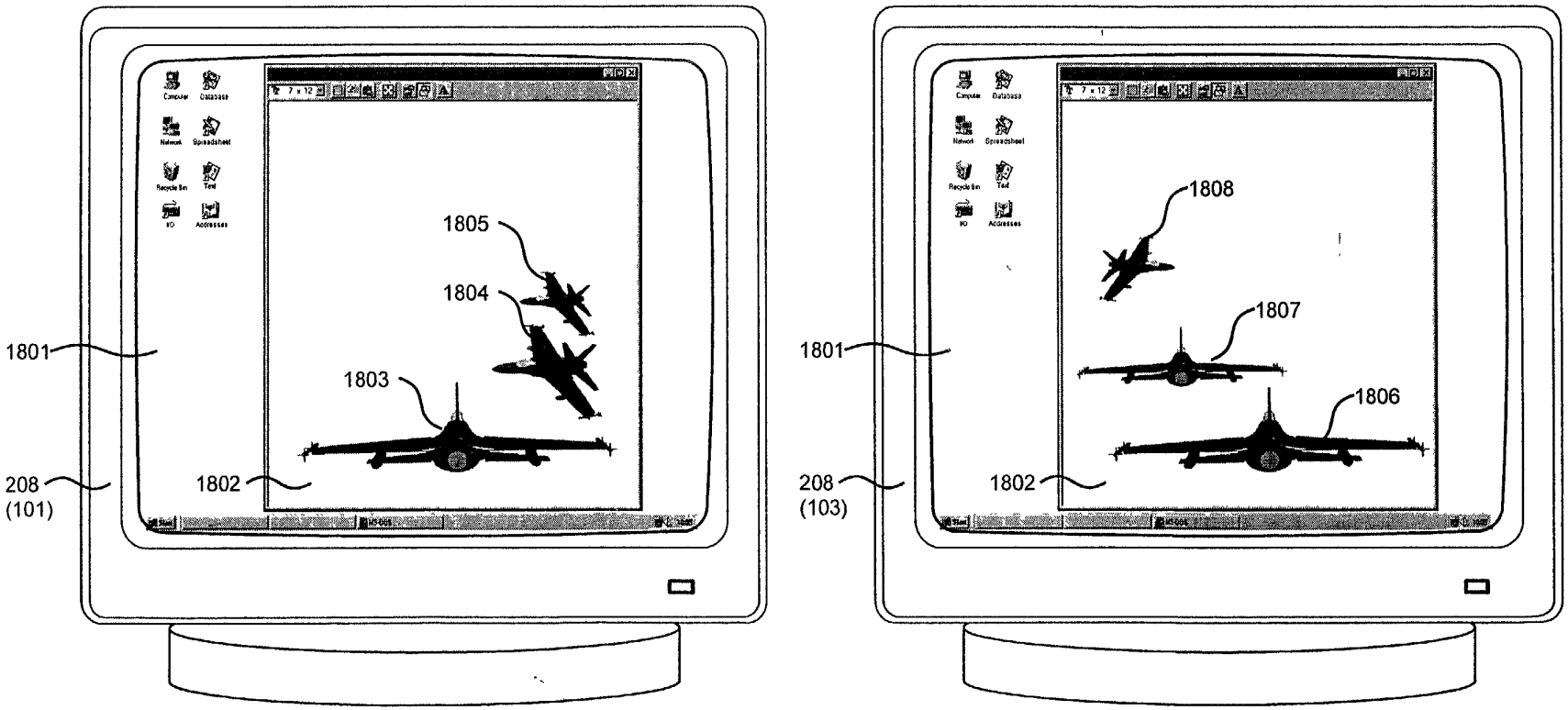
1801
208
(101)
1802
1803
1804
1805
1801
208
(103)
1802
1806
1807
1808

Figure 18